

**WHAT IS CLAIMED IS:**

1. A polyester polymerization catalyst containing no antimony or germanium whose activity parameter (AP) fulfills Formula [1] shown below and the thermal stability degree (TD) of a polyethylene terephthalate polymerized using which fulfills Formula [2] shown below:

$$[1] \text{ AP (min)} < 2T(\text{min})$$

wherein AP is a time (min) required for a polymerization using the catalyst at 275°C under reduced pressure of 0.1 Torr to obtain a polyethylene terephthalate whose intrinsic viscosity is 0.5 dl/g. T is an AP observed when using antimony trioxide as a catalyst. The added amount of antimony trioxide is 0.05 mol% as antimony atom based on an acid component in a resultant polyethylene terephthalate; and,

$$[2] \text{ TD (\%)} < 25$$

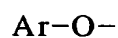
wherein TD is a % reduction in the intrinsic viscosity after keeping 1g of PET, whose initial intrinsic viscosity was 0.6 dl/g, in a glass tube as melt state under a nitrogen atmosphere at 300°C for 2 hours ,after drying the PET at 130°C for 12 hours in vacuum.

2. The polyester polymerization catalyst according to Claim 1 comprising at least one metal-containing component selected from metals and/or metal compounds containing no antimony nor germanium and an organic compound component.

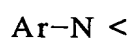
3. The polyester polymerization catalyst according to Claim

2 wherein said organic compound component is at least one compound selected from the group of the compounds containing the moieties represented by Formula 1 and/or Formula 2:

(Formula 1)



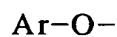
(Formula 2)



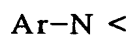
wherein Ar represents an aryl group.

4. A polyester polymerization catalyst comprising at least one metal-containing component selected from metals and/or metal compounds comprising no antimony nor germanium and an organic compound component wherein said organic compound component is at least one compound selected from the group of the compounds containing the moieties represented by Formula 1 and/or Formula 2:

(Formula 1)



(Formula 2)



wherein Ar represents an aryl group.

5. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at

least one selected from an alkaline metal, an alkaline earth metal, or a compound thereof.

6. The polyester polymerization catalyst according to Claim 5 wherein said alkaline metal or alkaline earth metal is at least one selected from Li, Na, K, Rb, Cs, Be, Mg, Ca, Sr and Ba.

7. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at least one selected from Al, Ga, Tl, Pb, Bi and a compound thereof.

8. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at least one selected from Tl, Pb, Bi and a compound thereof.

9. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at least one selected from Cr, Ni, Mo, Tc, Re and a compound thereof.

10. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at least one selected from Cr, Ni and a compound thereof.

11. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at least one selected from Sc, Y, Zr, Hf, V and a compound thereof.

12. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at least one selected from Sc, Y, Zr, Hf and a compound thereof.

13. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at

least one selected from Ru, Rh, Pd, Os, Ir, Pt and a compound thereof.

14. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at least one selected from Ru, Pd and a compound thereof.

15. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at least one selected from Cu, Ag, Au, Cd, Hg and a compound thereof.

16. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at least one selected from Cu, Ag and a compound thereof.

17. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at least one selected from Lanthanoid metals and compounds thereof.

18. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at least one selected from the group consisting of La, Ce, Sm, Eu, Gd and compounds thereof.

19. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at least one selected from In and a compound thereof.

20. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at least one selected from Mn, Co, Zn and a compound thereof.

21. The polyester polymerization catalyst according to any

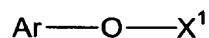
one of Claims 2 to 4 wherein said metal-containing component is at least one selected from Fe, Nb, Ta, W and a compound thereof.

22. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at least one selected from Fe and a compound thereof.

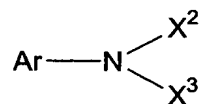
23. The polyester polymerization catalyst according to any one of Claims 2 to 4 wherein said metal-containing component is at least one selected from Si, Te, B and a compound thereof.

24. The polyester polymerization catalyst according to any one of Claims 3 to 23 wherein each of the compounds containing the moieties represented by Formula 1 and/or Formula 2 is a compound containing the moieties represented by Formula 3 and/or Formula 4:

(Formula 3)



(Formula 4)

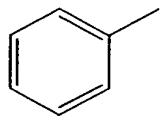


wherein Ar represents an aryl group, each of  $\text{X}^1$ ,  $\text{X}^2$  and  $\text{X}^3$  independently represents hydrogen, a hydrocarbon group, an acyl group, a sulfonyl-containing group, a phosphoryl-containing group or an ether bond-containing hydrocarbon group.

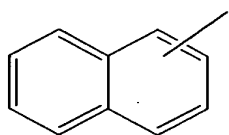
25. The polyester polymerization catalyst according to Claim 24 wherein an Ar in said Formulae 3 and/or 4 is selected from the group consisting of the moieties represented by Formulae

5 to 12:

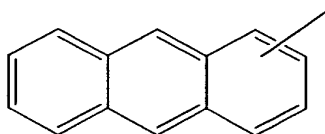
(Formula 5)



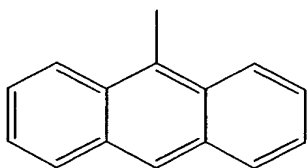
(Formula 6)



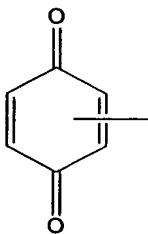
(Formula 7)



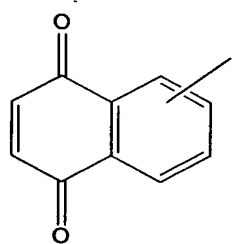
(Formula 8)



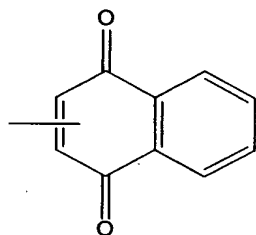
(Formula 9)



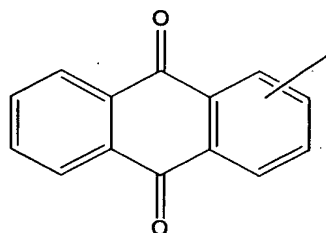
(Formula 10)



(Formula 11)

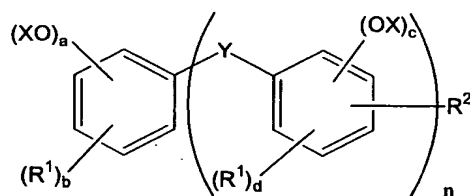


(Formula 12)

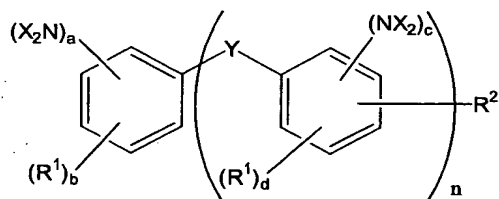


26. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of a linear phenol compound and a linear aniline compound represented by Formulae 13 and 14 and a derivative thereof:

(Formula 13)



(Formula 14)



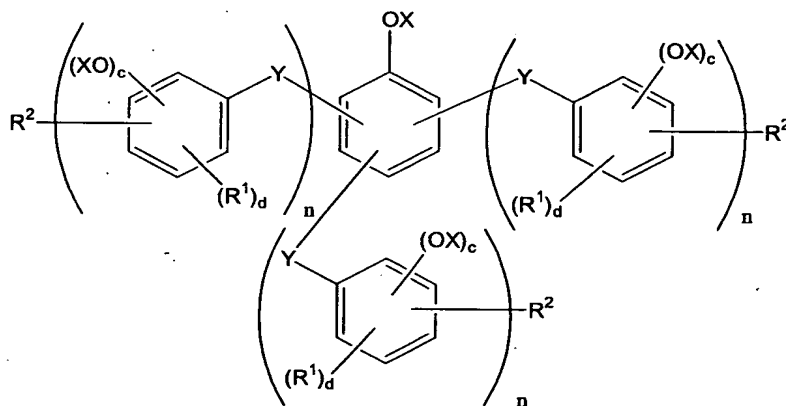
wherein each  $R^1$  is same or different and represents a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, a halogen group, a carboxyl group or its ester, a formyl group, an acyl group, a group represented by (acyl)-O-, an amino group, a mono- or dialkylamino group, an amide group or its substituted form, a hydroxyl group, an alkoxyl group, an alkylthio group, a sulfonyl-containing group, a phosphoryl-containing group, a nitro group, a cyano group or a thiocyno group, each  $R^2$  is same or different and represents hydrogen, a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, a halogen group, a carboxyl group or its ester, a formyl group, an acyl group, a group represented by (acyl)-O-, an amino group, a mono- or dialkylamino group, an amide group or its substituted form, a hydroxyl group, an alkoxyl group, an alkylthio group, a sulfonyl-containing group, a phosphoryl-containing group, a nitro group, a



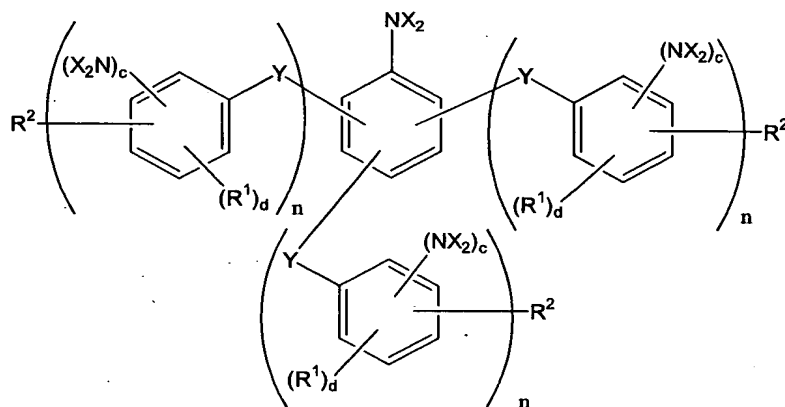
cyano group or a thiocyano group, each X is same or different and represents hydrogen, a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, an acyl group, a sulfonyl-containing group, a phosphoryl-containing group or an ether bond-containing hydrocarbon group, each Y is same or different and represents a direct bond, a C1-C10 alkylene group, -(alkylene)-O-, -(alkylene)-S-, -O-, -S-, -SO<sub>2</sub>-, -CO- or -COO-, n represents an interger of 1 to 100, each of a and c is an integer of 1 to 3, each of b and d is 0 or an integer of 1 to 3, provided that  $1 \leq a+b \leq 5$ ,  $1 \leq c+d \leq 4$ , and each d may be same or different, as well as a derivative thereof.

27. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of a branched linear phenol compound and a branched linear aniline compound represented by Formulae 15 and 16 and a derivative thereof:

(Formula 15)



(Formula 16)

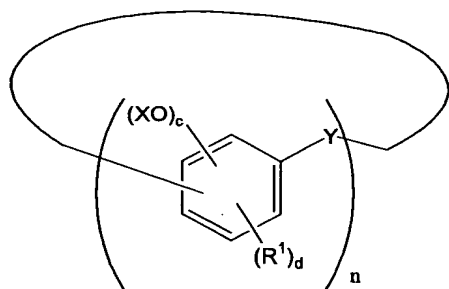


wherein each  $R^1$  is same or different and represents a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, a halogen group, a carboxyl group or its ester, a formyl group, an acyl group, a group represented by (acyl)-O-, an amino group, a mono- or dialkylamino group, an amide group or its substituted form, a hydroxyl group, an alkoxyl group, an alkylthio group, a sulfonyl-containing group, a phosphoryl-containing group, a nitro group, a cyano group or a thiocyno group, each  $R^2$  is same or different and represents hydrogen, a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, a halogen group, a carboxyl group or its ester, a formyl group, an acyl group, a group represented by (acyl)-O-, an amino group, a mono- or dialkylamino group, an amide group or its substituted form, a hydroxyl group, an alkoxyl group, an alkylthio group, a sulfonyl-containing group, a phosphoryl-containing group, a nitro group, a

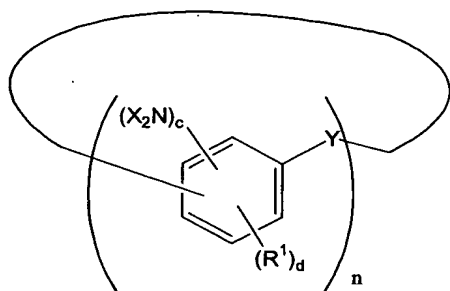
cyano group or a thioccyano group, each X is same or different and represents hydrogen, a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, an acyl group, a sulfonyl-containing group, a phosphoryl-containing group or an ether bond-containing hydrocarbon group, each Y is same or different and represents a direct bond, a C1-C10 alkylene group, -(alkylene)-O-, -(alkylene)-S-, -O-, -S-, -SO<sub>2</sub>-, -CO- or -COO-, each n is same or different and represents an interger of 1 to 100, each c is same or different and represents an integer of 1 to 3, each d is same or different and represents 0 or an integer of 1 to 3, provided that  $1 \leq c+d \leq 4$ , as well as a derivative thereof.

28. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of a cyclic phenol compound and a cyclic aniline compound represented by Formulae 17 and 18 and a derivative thereof:

(Formula 17)



(Formula 18)

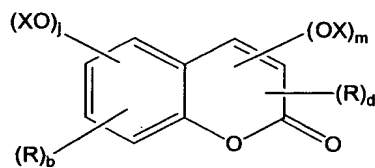


wherein each  $R^1$  is same or different and represents a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, a halogen group, a carboxyl group or its ester, a formyl group, an acyl group, a group represented by (acyl)-O-, an amino group, a mono- or dialkylamino group, an amide group or its substituted form, a hydroxyl group, an alkoxyl group, an alkylthio group, a sulfonyl-containing group, a phosphoryl-containing group, a nitro group, a cyano group or a thiocyno group, each X is same or different and represents hydrogen, a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, an acyl group, a sulfonyl-containing group, a phosphoryl-containing group or an ether bond-containing hydrocarbon group, each Y is same or different and represents a direct bond, a C1-C10 alkylene group, - (alkylene)-O-, -(alkylene)-S-, -O-, -S-, -SO<sub>2</sub>-, -CO- or -COO-, n represents an interger of 1 to 100, c represents an integer of 1 to 3, d represents 0 or an integer of 1 to 3, provided that  $1 \leq c+d \leq 4$ , and each d may be same or different, as well as a derivative thereof.

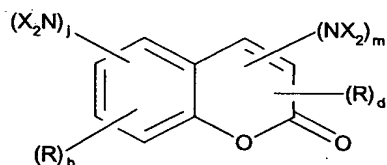
29. The polyester polymerization catalyst according to

Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of a coumarine derivative represented by Formulae 19 and 20 or a chromone derivative represented by Formulae 21 and 22:

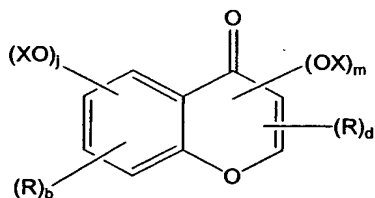
(Formula 19)



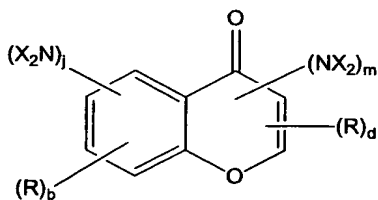
(Formula 20)



(Formula 21)



(Formula 22)

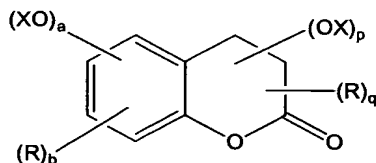


wherein each R is same or different and represents a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, a halogen group, a carboxyl group or its ester, a formyl group, an acyl group, a group represented by

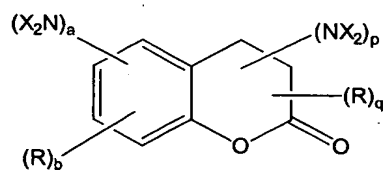
(acyl)-O-, an amino group, a mono- or dialkylamino group, an amide group or its substituted form, a hydroxyl group, an alkoxyl group, an alkylthio group, a sulfonyl-containing group, a phosphoryl-containing group, a nitro group, a cyano group or a thiocyano group, each X is same or different and represents hydrogen, a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, an acyl group, a sulfonyl-containing group, a phosphoryl-containing group or an ether bond-containing hydrocarbon group, each of j and b is 0 or an integer of 1 to 3, each of m and d is 0 or an integer of 1 to 2, provided that  $0 \leq j+b \leq 4$ ,  $0 \leq m+d \leq 2$  and  $1 \leq j+m \leq 5$ , as well as a derivative thereof.

30. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of a dihydrocoumarine derivative represented by Formulae 23 and 24, a chromanone derivative represented by Formulae 25 and 26, or an isochromanone derivative represented by Formulae 27 and 28:

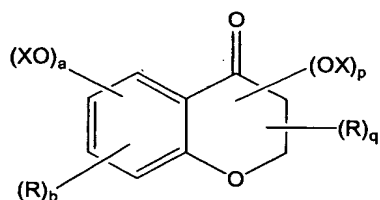
(Formula 23)



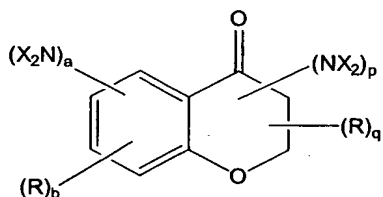
(Formula 24)



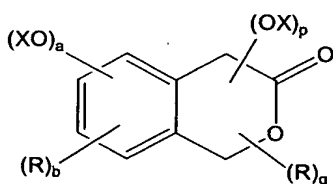
(Formula 25)



(Formula 26)



(Formula 27)



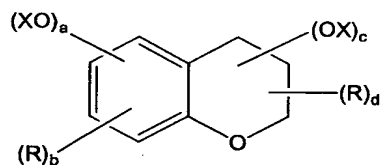
(Formula 28)

wherein each R is same or different and represents a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, a halogen group, a carboxyl group or its ester, a formyl group, an acyl group, a group represented by

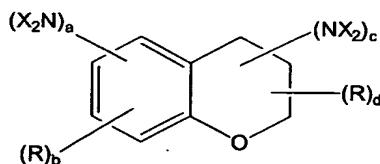
(acyl)-O-, an amino group, a mono- or dialkylamino group, an amide group or its substituted form, a hydroxyl group, an alkoxyl group, an alkylthio group, a sulfonyl-containing group, a phosphoryl-containing group, a nitro group, a cyano group or a thiocyano group, each X is same or different and represents hydrogen, a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, an acyl group, a sulfonyl-containing group, a phosphoryl-containing group or an ether bond-containing hydrocarbon group, a is an integer of 1 to 3, b is 0 or an integer of 1 to 3, and each of p and q is 0 or an integer of 1 to 2, provided that  $1 \leq a+b \leq 4$  and  $0 \leq p+q \leq 2$ , as well as a derivative thereof.

31. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of a chroman derivative represented by Formulae 29 and 30 or a isochroman derivative represented by Formulae 31 and 32:

(Formula 29)

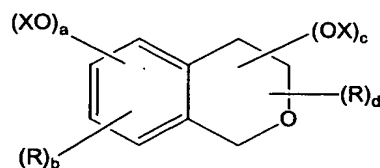


(Formula 30)

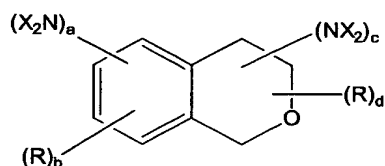




(Formula 31)



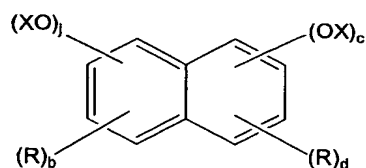
(Formula 32)



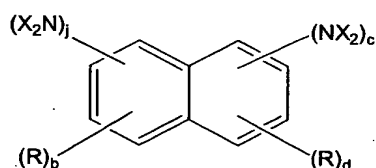
wherein each R is same or different and represents a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, a halogen group, a carboxyl group or its ester, a formyl group, an acyl group, a group represented by (acyl)-O-, an amino group, a mono- or dialkylamino group, an amide group or its substituted form, a hydroxyl group, an alkoxyl group, an alkylthio group, a sulfonyl-containing group, a phosphoryl-containing group, a nitro group, a cyano group or a thiocyano group, each X is same or different and represents hydrogen, a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, an acyl group, a sulfonyl-containing group, a phosphoryl-containing group or an ether bond-containing hydrocarbon group, a is an integer of 1 to 3, b is 0 or an integer of 1 to 3, each of c and d is 0 or an integer of 1 to 3, provided that  $1 \leq a+b \leq 4$  and  $0 \leq c+d \leq 3$ , as well as a derivative thereof.

32. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of a naphthalene derivative represented by Formulae 33 and 34 or a bisnaphthyl derivative represented by Formulae 35 and 36:

(Formula 33)



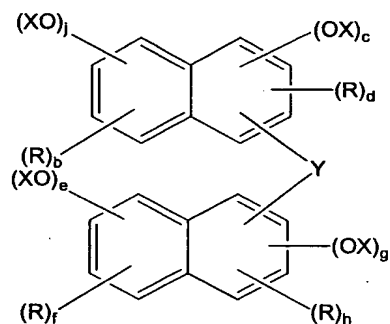
(Formula 34)



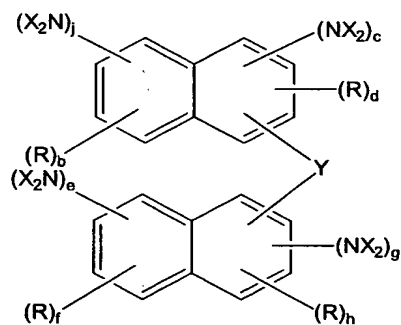
wherein each R is same or different and represents a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, a halogen group, a carboxyl group or its ester, a formyl group, an acyl group, a group represented by (acyl)-O-, an amino group, a mono- or dialkylamino group, an amide group or its substituted form, a hydroxyl group, an alkoxyl group, an alkylthio group, a sulfonyl-containing group, a phosphoryl-containing group, a nitro group, a cyano group or a thiocyno group, each X is same or different and represents hydrogen, a C1-C20 hydrocarbon group, a hydroxyl group- or

halogen group-carrying C1-C20 hydrocarbon group, an acyl group, a sulfonyl-containing group, a phosphoryl-containing group or an ether bond-containing hydrocarbon group, each of j, b, c and d is 0 or an integer of 1 to 3, provided that  $0 \leq j+b \leq 4$ ,  $0 \leq c+d \leq 4$  and  $1 \leq j+c \leq 6$ ,

(Formula 35)



(Formula 36)

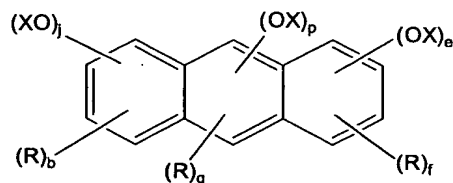


wherein each R is same or different and represents a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, a halogen group, a carboxyl group or its ester, a formyl group, an acyl group, a group represented by (acyl)-O-, an amino group, a mono- or dialkylamino group, an amide group or its substituted form, a hydroxyl group, an alkoxy

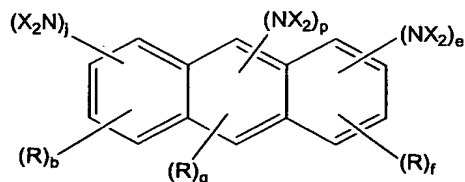
group, an alkylthio group, a sulfonyl-containing group, a phosphoryl-containing group, a nitro group, a cyano group or a thiocyano group, each X is same or different and represents hydrogen, a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, an acyl group, a sulfonyl-containing group, a phosphoryl-containing group or an ether bond-containing hydrocarbon group, Y represents a direct bond, a C1-C10 alkylene group, -(alkylene)-O-, -(alkylene)-S-, -O-, -S-, -SO<sub>2</sub>-, -CO- or -COO-, each of j, b, c, d, e, f, g and h is 0 or an integer of 1 to 3, provided that  $0 \leq j+b \leq 4$ ,  $0 \leq c+d \leq 3$ ,  $0 \leq e+f \leq 4$ ,  $0 \leq g+h \leq 3$  and  $1 \leq j+c+e+g \leq 12$ , as well as a derivative thereof.

33. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of an anthracene derivative represented by Formulae 37 and 38:

(Formula 37)



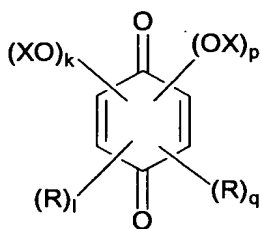
(Formula 38)



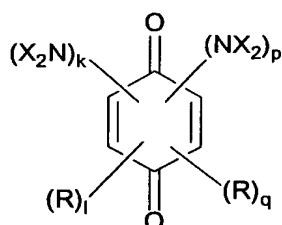
wherein each R is same or different and represents a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, a halogen group, a carboxyl group or its ester, a formyl group, an acyl group, a group represented by (acyl)-O-, an amino group, a mono- or dialkylamino group, an amide group or its substituted form, a hydroxyl group, an alkoxyl group, an alkylthio group, a sulfonyl-containing group, a phosphoryl-containing group, a nitro group, a cyano group or a thiocyano group, each X is same or different and represents hydrogen, a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, an acyl group, a sulfonyl-containing group, a phosphoryl-containing group or an ether bond-containing hydrocarbon group, each of j, b, e and f is 0 or an integer of 1 to 3, each of p and q is 0 or an integer of 1 to 2, provided that  $0 \leq j+b \leq 4$ ,  $0 \leq p+q \leq 2$ ,  $0 \leq e+f \leq 4$  and  $1 \leq j+p+e \leq 8$ .

34. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of a benzoquinone derivative represented by Formulae 39 and 40:

(Formula 39)



(Formula 40)

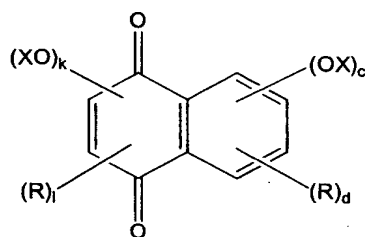


wherein each R is same or different and represents a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, a halogen group, a carboxyl group or its ester, a formyl group, an acyl group, a group represented by (acyl)-O-, an amino group, a mono- or dialkylamino group, an amide group or its substituted form, a hydroxyl group, an alkoxyl group, an alkylthio group, a sulfonyl-containing group, a phosphoryl-containing group, a nitro group, a cyano group or a thiocyno group, each X is same or different and represents hydrogen, a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, an acyl group, a sulfonyl-containing group, a phosphoryl-containing group or an ether bond-containing hydrocarbon group, each of k, l, p and q is 0

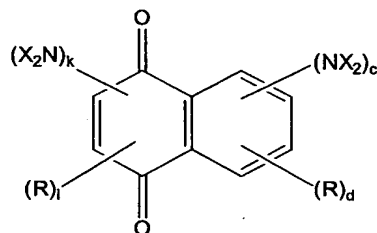
or an integer of 1 to 2, provided that  $0 \leq k+1 \leq 2$ ,  $0 \leq p+q \leq 2$  and  $1 \leq k+p \leq 4$ .

35. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of a naphthoquinone derivative represented by Formulae 41 and 42:

(Formula 41)



(Formula 42)

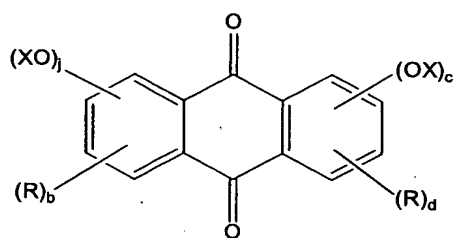


wherein each R is same or different and represents a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, a halogen group, a carboxyl group or its ester, a formyl group, an acyl group, a group represented by (acyl)-O-, an amino group, a mono- or dialkylamino group, an amide group or its substituted form, a hydroxyl group, an alkoxyl

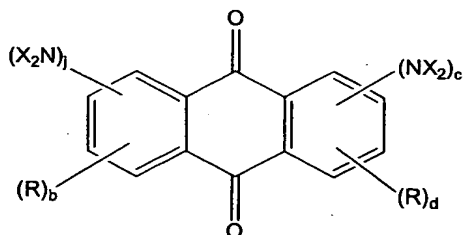
group, an alkylthio group, a sulfonyl-containing group, a phosphoryl-containing group, a nitro group, a cyano group or a thiocyno group, each X is same or different and represents hydrogen, a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, an acyl group, a sulfonyl-containing group, a phosphoryl-containing group or an ether bond-containing hydrocarbon group, each of k and l is 0 or an integer of 1 to 2, each of c and d is 0 or an integer of 1 to 3, provided that  $0 \leq k+l \leq 2$ ,  $0 \leq c+d \leq 4$  and  $1 \leq k+c \leq 5$ .

36. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of an anthraquinone derivative represented by Formulae 43 and 44:

(Formula 43)



(Formula 44)

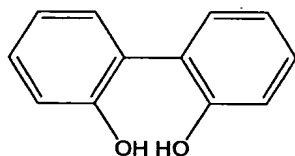




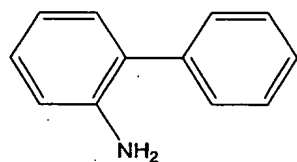
wherein each R is same or different and represents a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, a halogen group, a carboxyl group or its ester, a formyl group, an acyl group, a group represented by (acyl)-O-, an amino group, a mono- or dialkylamino group, an amide group or its substituted form, a hydroxyl group, an alkoxyl group, an alkylthio group, a sulfonyl-containing group, a phosphoryl-containing group, a nitro group, a cyano group or a thiocyano group, each X is same or different and represents hydrogen, a C1-C20 hydrocarbon group, a hydroxyl group- or halogen group-carrying C1-C20 hydrocarbon group, an acyl group, a sulfonyl-containing group, a phosphoryl-containing group or an ether bond-containing hydrocarbon group, each of j, b, c and d is 0 or an integer of 1 to 3, provided that  $0 \leq j+b \leq 4$ ,  $0 \leq c+d \leq 4$  and  $1 \leq j+c \leq 6$ .

37. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of 2,2'-bisphenol represented by Formulae 45 or 2-aminobiphenyl represented by Formula 46:

(Formula 45)



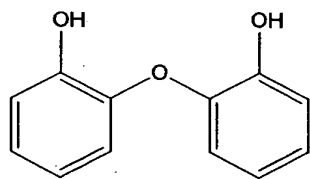
(Formula 46)



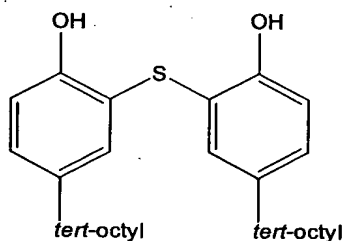
as well as a derivative thereof.

38. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of 2,2'-dihydroxydiphenylether represented by Formula 47, 2,2'-thiobis(4-*t*-octylphenol) represented by Formula 48 or 2,2'-methylenebis(6-*t*-butyl-*p*-cresol) represented by Formula 49:

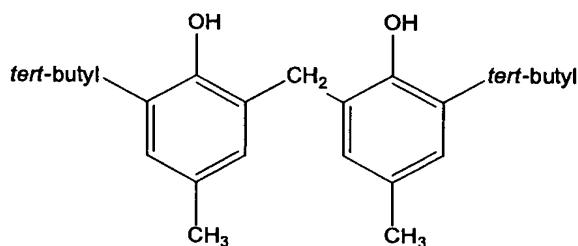
(Formula 47)



(Formula 48)



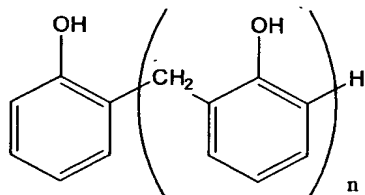
(Formula 49)



as well as a derivative thereof.

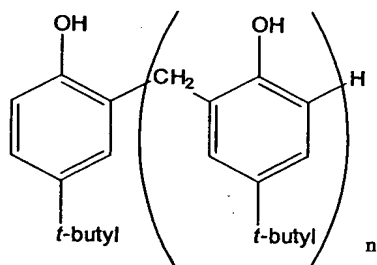
39. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of a methylene-bridged linear phenol compound represented by Formula 50 (mixture of dimer to 100-mer) or a methylene-bridged linear p-t-butylphenol compound represented by Formula 51 (mixture of dimer to 100-mer):

(Formula 50)



wherein n is an integer of 1 to 99,

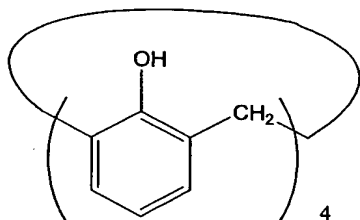
(Formula 51)



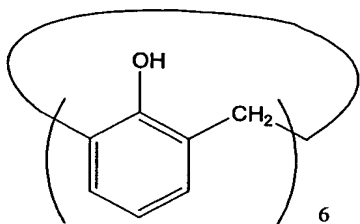
wherein n is an integer of 1 to 99, as well as a derivative thereof.

40. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formula 3 and/or 4 is a compound selected from the group consisting of Calix [4] arene represented by Formula 52, Calix [6] arene represented by Formula 53, Calix [8] arene represented by Formula 54, p-t-butyl Calix [4] arene represented by Formula 55, p-t-butyl Calix [6] arene represented by Formula 56 or p-t-butyl Calix [8] arene represented by Formula 57:

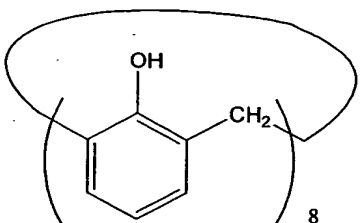
(Formula 52)



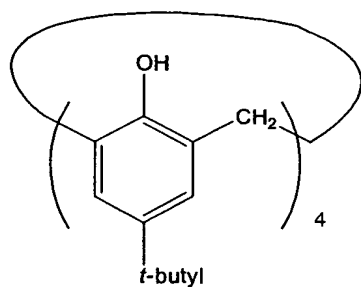
(Formula 53)



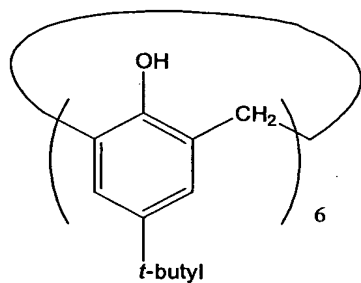
(Formula 54)



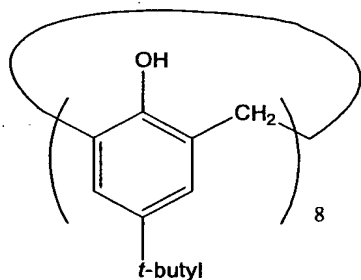
(Formula 55)



(Formula 56)



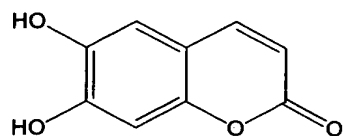
(Formula 57)



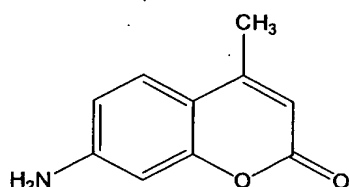
as well as a derivative thereof.

41. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of esculetin represented by Formula 58, 7-amino-4-methylcoumarine represented by Formula 59:

(Formula 58)



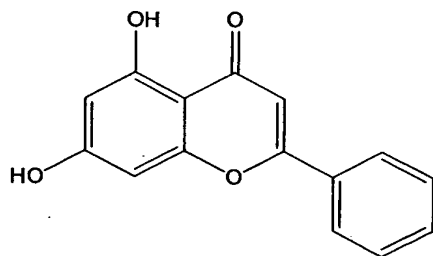
(Formula 59)



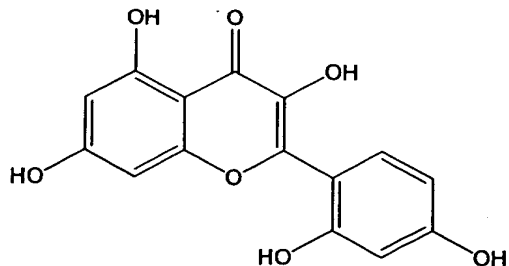
as well as a derivative thereof.

42. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of chrysin represented by Formula 60, morin represented by Formula 61 or 2-aminochromone represented by Formula 62:

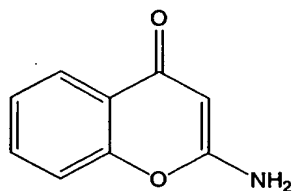
(Formula 60)



(Formula 61)



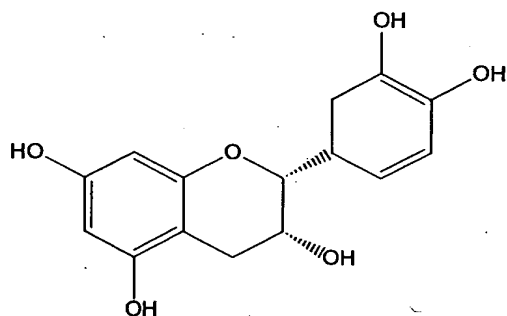
(Formula 62)



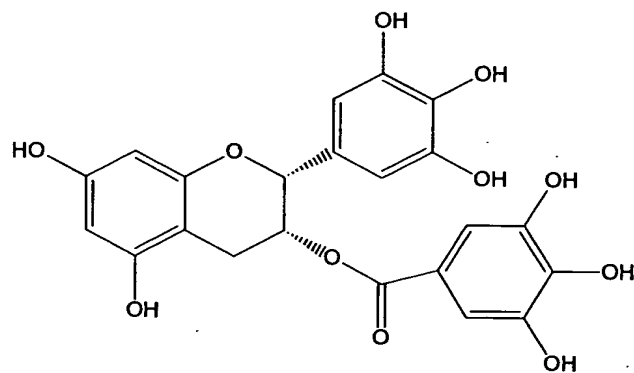
as well as a derivative thereof.

43. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of epicatechin represented by Formula 63 or epigallocatechin gallate represented by Formula 64:

(Formula 63)



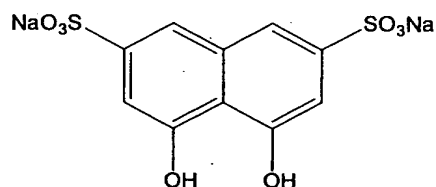
(Formula 64)



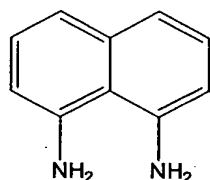
as well as a derivative thereof.

44. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of disodium 4,5-dihydroxynaphthalene-2,7-disulfonate represented by Formula 65, 1,8-diaminonaphthalene represented by Formula 66, naphthol AS represented by Formula 67, 1,1'-bi-2-naphthol represented by Formula 68 or 1,1'-binaphthyl-2,2'-diamine represented by Formula 69:

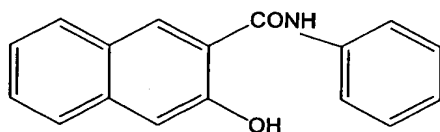
(Formula 65)



(Formula 66)

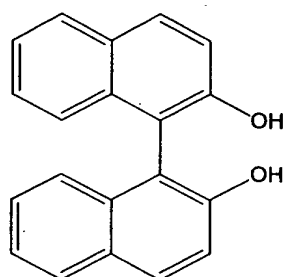


(Formula 67)

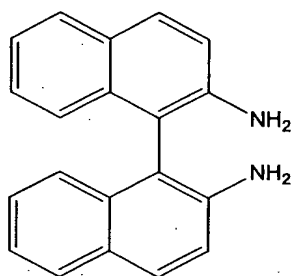


(Formula 68)





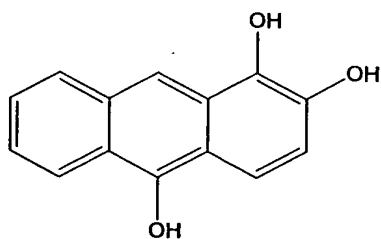
(Formula 69)



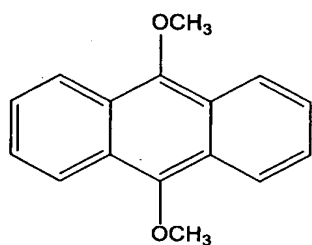
as well as a derivative thereof.

45. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of anthrarobin represented by Formula 70, 9,10-dimethoxyanthracene represented by Formula 71 or 2-aminoanthracene represented by Formula 72:

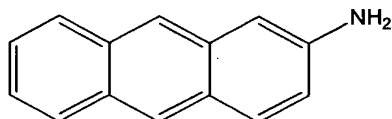
(Formula 70)



(Formula 71)



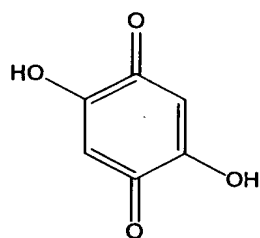
(Formula 72)



as well as a derivative thereof.

46. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of 2,5-dihydroxybenzoquinone represented by Formula 73:

(Formula 73)

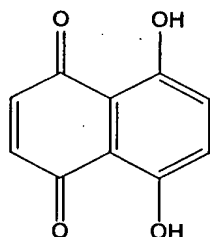


as well as a derivative thereof.

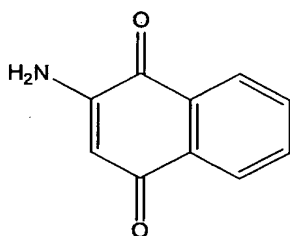
47. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group

consisting of 5,8-dihydroxy-1,4-naphthoquinone represented by Formula 74 or 2-aminonaphthoquinone represented by Formula 75:

(Formula 74)



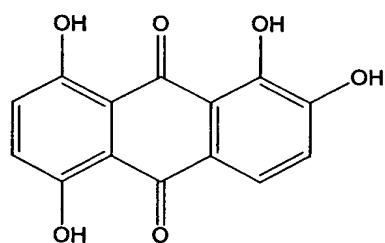
(Formula 75)



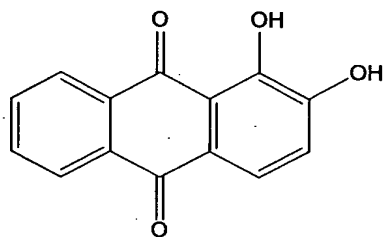
as well as a derivative thereof.

48. The polyester polymerization catalyst according to Claim 24 wherein a compound containing a structure represented by said Formulae 3 and/or 4 is a compound selected from the group consisting of quinalizarin represented by Formula 76, alizarin represented by Formula 77, quinizarin represented by Formula 78, anthrarufin represented by Formula 79, emodine represented by Formula 80, 1,4-diaminoanthraquinone represented by Formula 81, 1,8-diamino-4,5-dihydroxyanthraquinone represented by Formula 82 or acid blue 25 represented by Formula 83:

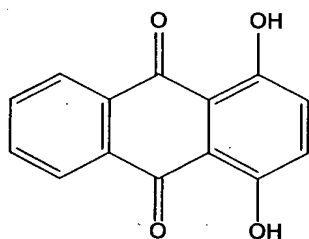
(Formula 76)



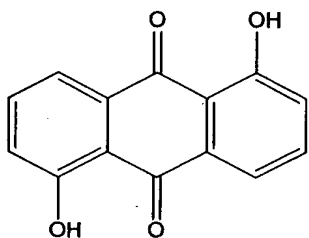
(Formula 77)



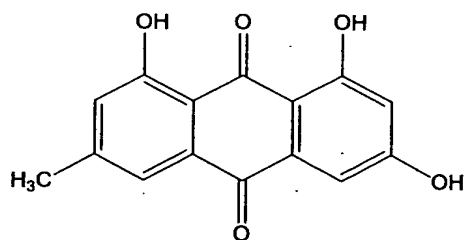
(Formula 78)



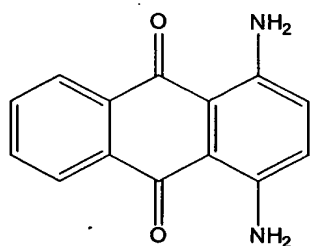
(Formula 79)



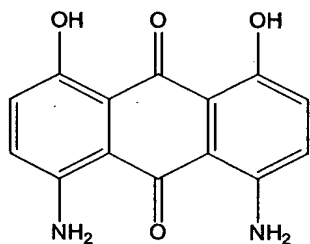
(Formula 80)



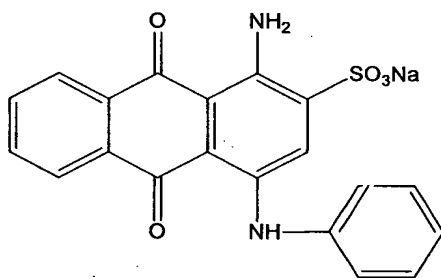
(Formula 81)



(Formula 82)



(Formula 83)



as well as a derivative thereof.

49. A polyester polymerization catalyst having a substantial catalytic activity and comprising at least 2 components, the first of which has substantially no catalytic activity for a polyester polymerization and the second of which has substantially no catalytic activity for a polyester polymerization.

50. The polyester polymerization catalyst according to Claim 49 wherein said first component is a metal and/or a metal

compound.

51. A polyester produced using a polyester polymerization catalyst having a substantial catalytic activity and comprising at least 2 components, the first of which has substantially no catalytic activity for a polyester polymerization and the second of which has substantially no catalytic activity for a polyester polymerization.

52. a polyester produced using the polyester polymerization catalyst according to any one of Claims 1 to 50.

53. The polyester according to Claim 52 whose dicarboxylic acid component consists mainly of at least one of terephthalic acid and naphthalene dicarboxylic acid.

54. The polyester according to Claim 52 or 53 whose glycol component consists mainly of at least one of ethylene glycol, 1,3-propanediol, 1,4-butanediol and 1,4-cyclohexane dimethanol.

55. The polyester according to Claim 53 or 54 wherein said polyester is a polyethylene naphthalate.

56. The polyester according to Claim 53 or 54 wherein said polyester is a polybutylene terephthalate.

57. The polyester according to Claim 53 or 54 wherein said polyester is a polypropylene terephthalate.

58. The polyester according to Claim 53 or 54 wherein said polyester is a cyclohexane dimethanol-copolymerized polyethylene terephthalate.

59. A polyester film produced by using the polyester according to any one of Claims 51 to 58.

60. A molded hollow article produced by using the polyester according to any one of Claims 51 to 58.

61. The molded hollow article according to Claim 60 wherein said polyester contains diethylene glycol (DEG) in an amount of 1.5 to 5.0% by mole of its glycol component and has an intrinsic viscosity of 0.57 to 0.90 dl/g and the density of 1.37 g/cm<sup>3</sup>.

62. The molded hollow article according to Claim 60 or 61 wherein said polyester contains acetoaldehyde in an amount of 10 ppm or less and a cyclic trimer in an amount of 0.35% by weight or less.

63. A polyester fiber produced by using the polyester according to any one of Claims 51 to 58.

64. The polyester fiber according to Claim 63 produced by using a polyester further copolymerized with a metal sulfonate group-containing component.

65. The polyester fiber according to Claim 64 wherein said metal sulfonate group-containing component is present in an amount of 0.3 to 10% by mole based on all dicarboxylic acids constituting the polyester and 80% by mole or more of the repeating units of the polymer is constituted by polyethylene terephthalate units.

66. The polyester fiber according to any one of Claims 63 to 65 wherein a polyester supplemented or copolymerized further with a flame retardant agent is employed.

67. The flame retardant polyester fiber according to Claim 66 wherein a phosphorus compound is contained as a flame retardant agent in an amount as phosphorus atom of 0.2 to 3.0% by weight based on the entire amount of the fiber.

68. A method for producing a polyester using the polyester polymerization catalyst according to any one of Claims 1 to 50.

69. A method for producing the polyester according to Claim 68 wherein a metal-containing component and an organic compound component are added at the same time.

70. A method for producing the polyester according to Claim 68 wherein a metal-containing component and an organic compound component are added at an interval.

71. A method for producing the polyester according to Claim 68 whose dicarboxylic acid component consists mainly of at least one of terephthalic acid and naphthalene dicarboxylic acid.

72. A method for producing the polyester according to Claim 68 or 69 whose glycol component consists mainly of at least one of ethylene glycol, 1,3-propanediol, 1,4-butanediol and 1,4-cyclohexane dimethanol.

73. A method for producing a polyethylene naphthalate using the polyester polymerization catalyst according to any one of Claims 1 to 50.

74. A method for producing a polybutylene terephthalate using the polyester polymerization catalyst according to any one of Claims 1 to 50.



75. A method for producing a polypropylene terephthalate using the polyester polymerization catalyst according to any one of Claims 1 to 50.

76. A method for producing a cyclohexane dimethanol-copolymerized polyethylene terephthalate using the polyester polymerization catalyst according to any one of Claims 1 to 50.